Exhibit 7

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

TQ DELTA, LLC,

        Plaintiff,

     v.

2WIRE, INC.,

        Defendant.

Civil Action No. 1:13-cv-01835-RGA

TQ DELTA, LLC,

        Plaintiff,

     v.

ZYXEL COMMUNICATIONS, INC
and
ZYXEL COMMUNICATIONS
CORPORATION,

        Defendants.

Civil Action No. 1:13-cv-02013-RGA

TQ DELTA, LLC,

        Plaintiff,

     v.

ADTRAN, INC.,

        Defendant.

Civil Action No. 1:14-cv-00954-RGA

ADTRAN, INC.,

       Plaintiff,

   v.

TQ DELTA, LLC,

       Defendant.

Civil Action No. 1:15-cv-00121-RGA

.

MEMORANDUM OPINION

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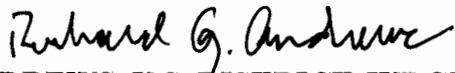
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December 18, 2017

Richard G. Andrew

ANDREWS, U.S. DISTRICT JUDGE:

Presently before the Court is the issue of claim construction of multiple terms in U.S.

Patent Nos. 7,831,890 ("the '890 patent"), 7,836,381 ("the '381 patent"), 7,844,882 ("the '882

patent"), 8,276,048 ("the'048 patent"), 8,495,473 ("the '473 patent"), and 8,607,126 ("the '126

patent"). The Court has considered the Parties' Joint Claim Construction Brief. (Civ. Act. No.

13-01835-RGA, D.I. 353; Civ. Act. No. 13-01836-RGA, D.I. 320; Civ. Act. No. 13-02013-RGA,

D.I. 339; Civ. Act. No. 14-00954-RGA, D.I. 194; Civ. Act. No. 15-00121-RGA; D.I. 196).[1] The

Court heard oral argument on November 13, 2017. (D.I. 430 ("Tr.")). After argument, the

parties agreed to dismissal of the case against Zhone. (Civ. Act. No. 13-1836-RGA; D.I. 373).

I.   BACKGROUND

The patents-in-suit represent "Family 3" of the patents that Plaintiff has asserted against

Defendants, and they all share a common specification. (D.I. 353 at 1 n.1). The parties divide

the contested patents into ten patent families. (*e.g.* D.I. 280). The Family 3 patents, at issue

here, relate to allocating shared memory used by a digital subscriber line ("DSL") transceiver, or

more specifically, allocating shared memory between an interleaver and deinterleaver of a DSL

transceiver.

II.   LEGAL STANDARD

"It is a bedrock principle of patent law that the claims of a patent define the invention to

which the patentee is entitled the right to exclude." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312

(Fed. Cir. 2005) (en banc) (internal quotation marks omitted). "'[T]here is no magic formula or

catechism for conducting claim construction.' Instead, the court is free to attach the appropriate

weight to appropriate sources 'in light of the statutes and policies that inform patent law.'"

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[1] Unless otherwise specifically noted, all references to the docket refer to Civil Action No. 13-1835-RGA.

SoftView LLC v. Apple Inc., 2013 WL 4758195, at *1 (D. Del. Sept. 4, 2013) (quoting *Phillips*,

415 F.3d at 1324) (alteration in original). When construing patent claims, a court considers the

literal language of the claim, the patent specification, and the prosecution history. *Markman v.*

Westview Instruments, Inc., 52 F.3d 967, 977–80 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370

(1996). Of these sources, "the specification is always highly relevant to the claim construction

analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term."

Phillips, 415 F.3d at 1315 (internal quotation marks omitted).

"[T]he words of a claim are generally given their ordinary and customary meaning. . . .

[Which is] the meaning that the term would have to a person of ordinary skill in the art in

question at the time of the invention, i.e., as of the effective filing date of the patent application."

Id. at 1312–13 (citations and internal quotation marks omitted). "[T]he ordinary meaning of a

claim term is its meaning to [an] ordinary artisan after reading the entire patent." *Id.* at 1321

(internal quotation marks omitted). "In some cases, the ordinary meaning of claim language as

understood by a person of skill in the art may be readily apparent even to lay judges, and claim

construction in such cases involves little more than the application of the widely accepted

meaning of commonly understood words." *Id.* at 1314.

When a court relies solely upon the intrinsic evidence—the patent claims, the

specification, and the prosecution history—the court's construction is a determination of law.

See Teva Pharm. USA, Inc. v. Sandoz, Inc., 135 S. Ct. 831, 841 (2015). The court may also

make factual findings based upon consideration of extrinsic evidence, which "consists of all

evidence external to the patent and prosecution history, including expert and inventor testimony,

dictionaries, and learned treatises." *Phillips*, 415 F.3d at 1317–19. Extrinsic evidence may assist

the court in understanding the underlying technology, the meaning of terms to one skilled in the

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art, and how the invention works. *Id.* Extrinsic evidence, however, is less reliable and less

useful in claim construction than the patent and its prosecution history. *Id.*

"A claim construction is persuasive, not because it follows a certain rule, but because it

defines terms in the context of the whole patent." *Renishaw PLC v. Marposs Societa' per

Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998). It follows that "a claim interpretation that would

exclude the inventor's device is rarely the correct interpretation." *Osram GMBH v. Int'l Trade

Comm'n*, 505 F.3d 1351, 1358 (Fed. Cir. 2007) (citation omitted).

III. TERMS FOR CONSTRUCTION

The asserted patents claim both an apparatus and a method for allocating shared memory

used by a DSL transceiver. Claim 5 of the '890 patent is representative and reads as follows:

1. A method of allocating shared memory in a transceiver comprising:

   transmitting or receiving, by the *transceiver*, a message during
   initialization specifying a maximum number of bytes of memory that are
   available to be allocated to a deinterleaver;

   determining, at the transceiver, an *amount of memory* required by the
   deinterleaver to deinterleave a first plurality of Reed Solomon (RS) coded
   data bytes within a *shared memory*;

   allocating, in the transceiver, a first number of bytes of the shared memory
   to the deinterleaver to deinterleave a first plurality of Reed Solomon (RS)
   coded data bytes for reception at a first data rate, wherein the allocated
   memory for the deinterleaver does not exceed the maximum number of
   bytes specified in the message;

   allocating, in the transceiver, a second number of bytes of the shared
   memory to an interleaver to interleave a second plurality of RS coded data
   bytes transmitted at a second data rate; and

   deinterleaving the first plurality of RS coded data bytes within the shared
   memory allocated to the deinterleaver and interleaving the second
   plurality of RS coded data bytes within the shared memory allocated to the
   interleaver,

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> wherein *the shared memory allocated to the deinterleaver is used at the same time as the shared memory allocated to the interleaver.*

('890 patent, claim 5) (disputed terms italicized). Claims 1 and 10 of the '126 patent are further

representative and read as follows:

> 1. An apparatus comprising:
>
> a multicarrier communications *transceiver* that is configured to perform a first interleaving function associated with a first *latency path* and perform a second interleaving function associated with a second latency path, the multicarrier communications transceiver being associated with a memory,
>
> wherein the *memory is allocated between the first interleaving function and the second interleaving function* in accordance with a message received during an initialization of the transceiver and *wherein at least a portion of the memory may be allocated to the first interleaving function or the second interleaving function at any one particular time depending on the message.*
>
> 10. An apparatus comprising:
>
> a multicarrier communications transceiver that is configured to generate a message during an initialization of the transceiver, perform a first deinterleaving function associated with a first latency path, and perform a second deinterleaving function associated with a second latency path, the transceiver being associated with a memory,
>
> wherein at least a *portion of the memory* may be allocated to the first deinterleaving function or the second deinterleaving function at any one particular time and *wherein the generated message indicates how the memory has been allocated between the first deinterleaving function and the second deinterleaving function.*

('126 patent, claims 1, 10) (disputed terms italicized).

1. "transceiver"

   a. *Plaintiff's proposed construction*: "communications device capable of transmitting and receiving data wherein the transmitter portion and receiver portion share at least some common circuitry"

   b. *Defendants' proposed construction*: "communications device capable of transmitting and receiving data"

   c. *Court's construction*: to be announced

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The parties agree that their Family 3 arguments for "transceiver" are the same as those made for Families 1 and 2. (Tr. at 18:14-22). Therefore, I will construe transceiver as I do for Families 1 and 2.

2. "shared memory"

a. *Plaintiff's proposed construction*: "a common memory space used by at least two functions, where particular memory cells within the common memory space can be used by either one of the functions"

b. *Defendants' proposed construction*: "single common memory in a transceiver used by at least two functions corresponding to at least two latency paths"

c. *Court's construction*: "common memory used by at least two functions, where a portion of the memory can be used by either one of the functions"

Plaintiff argues that "shared memory" should be construed as "a common memory space." (D.I. 353 at 42). The claims do not refer to "a common memory space," but the specification does at times refer to "common memory space." ('890 patent, 8:2-5). A patentee can be its own lexicographer, but to do so, the patentee "must clearly set forth a definition of the disputed claim term other than its plain and ordinary meaning." *Thorner v. Sony Comput. Entm't Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012). As Defendants note, the specification never actually defines "common memory space." (D.I. 353 at 46). I therefore do not adopt the term "common memory space." I instead use the agreed-upon "common" to modify "memory."

Defendants argue that "common memory" is "single." (D.I. 353 at 46). As evidence, Defendants point to the specification, which refers to "a" and "the" shared memory. (D.I. 353 at 38, 47). But the Federal Circuit has held that "a" or "an" is presumed to mean "one or more." *Baldwin Graphic Sys., Inc. v. Siebert, Inc.*, 512 F.3d 1338, 1342 (Fed. Cir. 2008). Thus, this language is not dispositive. As further evidence, Defendants point to Figure 1 of the '890 patent, which depicts just one "shared memory." (Tr. at 42:7-10). Indeed, the embodiment highlighted

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by Defendants shows just one memory. However, "claims of the patent will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using words or expressions of manifest exclusion or restriction." *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 906 (Fed. Cir. 2004).

Nothing in the patent demonstrates a clear intention to limit "common memory" to a "single" memory. Plaintiff raises the concern that including "single" in the construction might limit "shared memory" to a "single" memory "module," "block," or "chip." (D.I. 353 at 35). As discussed at oral argument, memory need not necessarily be a "single" memory "module," "block," or "chip" to be "shared." (Tr. at 44:1-50:13). For example, two people can share a "single" large pizza or two small pizzas to the same effect. Defendants agree that "scientifically," it does not matter if "common memory" comprises one physical memory structure or more than one physical memory structure. (Tr. 44:19-45:2). As a result, my construction does not use "single" to modify "common memory."

Plaintiff urges that my construction must clarify that "common memory" "can be used by either one of the functions." (D.I. 353 at 35). To support its contention, Plaintiff points to two types of shared memory that are unlike the shared memory described in the patents. First, Plaintiff notes that one type of shared memory involves functions in a single transceiver that use the memory for "interprocess communication." (Tr. at 21:5-22). Second, Plaintiff notes that yet another type of shared memory, known as "ping pang" memory, involves transmission in a single direction and uses a shared memory "exclusively for an interleaver" or "for a deinterleaver" at any one time. (Tr. at 21:23-22:18). Neither of these memories is like the "shared memory" at hand. Defendants do not contest that for these patents, at any one time, a certain part of the memory can be used by one function or the other, but not both. (D.I. 353 at 44, 48). Accordingly, in order to

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read out these other types of shared memory, I will include Plaintiff's language clarifying that common memory "can be used by either one of the functions."

Separately, Plaintiff argues that my construction should include a reference to "particular memory cells." (D.I. 353 at 35-36). But neither the specification nor the claims refers to "memory cells." Moreover, the jury will not have difficulty understanding "portion of the memory" to be physical memory. As a result, I will not include "memory cells" in my construction.

Next, the parties dispute whether "common memory" must be "in a transceiver." (D.I. 353 at 35). Some of the asserted claims, including claim 5 of the '890 patent, specifically dictate that "shared memory" is "in a transceiver." Others, including claim 13 of the '882 patent, do not. The doctrine of claim differentiation provides that "different words or phrases used in separate claims are presumed to indicate that the claims have different meanings and scopes." *Andersen Corp. v. Fiber Composites, LLC*, 474 F.3d 1361, 1369 (Fed. Cir. 2007).[2] Moreover, for the latter set of claims, including "in a transceiver" in the construction would be redundant. Thus, my construction does not mandate that "common memory" be in a transceiver when being in a transceiver is not explicitly claimed.

Finally, the parties dispute whether the functions "correspond[] to at least two latency paths." (D.I. 353 at 35). Like the prior dispute, some claims refer to functions associated with latency paths, and others do not. ('126 patent, claim 1; '890 patent, claim 5). Thus, in accordance with the doctrine of claim differentiation, my construction does not mandate that the functions "correspond[] to at least two latency paths."

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[2] The Federal Circuit has applied the doctrine of claim differentiation both within a single patent and within a family of patents. In *Andersen Corp.*, the court analyzed claim differentiation within the "Group I patents," which all stemmed from continuations based on a single application. *Andersen Corp.*, 474 F.3d at 1368-70. Likewise, the Family 3 patents share a specification.

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3. "amount of memory"

    a. *Plaintiff's proposed construction*: plain meaning or "number of units of memory"

    b. *Defendants' proposed construction*: "number of bytes of memory"

    c. *Court's construction*: plain meaning

The parties agree that "amount of memory" indicates a quantity of memory. (D.I. 353 at 50). They dispute whether this memory must be measured in "bytes." (*Id.* at 50-51).

Defendants argue that the intrinsic record refers to memory only in "bytes," and does not refers to "units of memory" or other measurements of memory. (D.I. 353 at 51-53).

Plaintiff, on the other hand, argues that "amount of memory" can be specified using any number of units, includes bits, kilobytes, or words. (D.I. 353 at 50-51; Tr. at 56:6-9). Furthermore, Plaintiff notes that the claims refer to both "amount of memory" and "bytes of memory." (Tr. at 56:10-23). Because the claims use different terms internally, Plaintiff argues, one must infer that a patentee intended to "reflect a differentiation in the meaning of those terms." (D.I. 353 at 53); *Innova/Pure Water, Inc. v. Safari Water Filtration Systems, Inc.*, 381 F.3d 1111, 1119 (Fed. Cir. 2004). Thus, Plaintiff contends that "amount of memory" must not be limited to "bytes of memory."

Ultimately, the parties agree that "amount of memory" will either be a "number of bytes" or a unit that is "probably convertible" to bytes. (Tr. at 61:20-22). Nonetheless, the term is broader than "bytes," and the jury will not have trouble deciding what is or is not an "amount of memory." Accordingly, I adopt a plain meaning construction. The plain meaning is not limited to bytes, and Defendants cannot argue that it is.

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4. **"the shared memory allocated to the [deinterleaver / interleaver] is used at the same time as the shared memory allocated to the [interleaver / deinterleaver]"**

   a. *Plaintiff's proposed construction*: "information is stored in, read from, or written to the shared memory allocated to the deinterleaver at the same time that information is stored in, read from, or written to the shared memory allocated to the interleaver"

   b. *Defendants' proposed construction*: "the deinterleaver reads from or writes to its respective allocation of the shared memory at the same time as the interleaver reads from or writes to its respective allocation of the shared memory"

   c. *Court's construction*: "the deinterleaver reads from, writes to, or holds information for deinterleaving in its respective allocation of the shared memory at the same time as the interleaver reads from, writes to, or holds information for interleaving in its respective allocation of the shared memory"

   The parties agreed upon a construction for this term. (D.I. 431 at 109:22-110:5; D.I. 426-

1, Exh. A at 5). Accordingly, I adopt their agreed-upon construction.

5. **"latency path"**

   a. *Plaintiff's proposed construction*: "a transmit or receive path, each path associated with a latency"

   b. *Defendants' proposed construction*: "distinct transmit or receive path"

   c. *Court's construction*: "transmit or receive path, wherein each path has a distinct, but not necessarily different, latency or delay"

   The parties agreed upon a construction for this term. (D.I. 431 at 109:22-110:5; D.I. 426-

1, Exh. A at 5). Accordingly, I substantially adopt their agreed-upon construction.

6. **"wherein at least a portion of the memory may be allocated to the [first] interleaving function or the [second interleaving / deinterleaving] function at any one particular time depending on the message"**

   a. *Plaintiff's proposed construction*: "at least some particular memory cells within the memory can be allocated for use either by the [first] interleaving function or [second interleaving / deinterleaving] function at any one particular time depending on the message"

   b. *Defendants' proposed construction*: "wherein at least a number of bytes within the memory may be allocated to the [first] interleaving function or the [second interleaving /

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deinterleaving] function at any one particular time depending on the amounts of memory specified in the message"

c. *Court's construction*: plain meaning

The parties first dispute whether a "portion of the memory" should be defined by "some particular memory cells within the memory" or "a number of bytes within the memory." This has already been resolved. Given that I gave "portion of the memory" a plain meaning construction, I give it a plain meaning construction in this context, as well.

The parties' next dispute is whether the claimed "message" must specify "amounts of memory." Defendants support their contention that this must be the case by pointing to the claim language, the specification, and the prosecution history. (D.I. 353 at 72-73, 76-77).

The claim language does not require that the message specify amounts of memory. The disputed term's language requires that the amount of memory depend on the message's contents, but it does not require that the message's contents themselves actually specify amounts of memory.

The specification likewise does not require that the message specify amounts of memory. Defendants correctly note that several embodiments in the specification provide that the message includes at least the amount of memory. (*See, e.g.,* '126 patent at 8:62-9:6; D.I. 353 at 72, 76-77). But Plaintiff points out that at least one example refers to what a transceiver "must know" rather than specifying an amount of memory in the message. ('126 patent at 7:62-8:22; D.I. 353 at 75). Defendants, in turn, argue that this example later explains that "a first transceiver *could* send a message to a second transceiver . . . containing the following information," which includes "Max Interleaver Memory for [each] latency path" and "Maximum total/shared memory for all latency paths." ('126 patent at 8:12-22; D.I. 353 at 76-78). However, this example is

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merely inclusive of a message specifying memory. It does not require a message specifying memory.

The prosecution history can be broken down into the examiner's statement in the notice of allowance for the '890 patent and the patentee's own amendments. The parties acknowledge that the '890 patent is the parent patent of the Family 3 patents. (Tr. at 89:4, 96:14-16).

In his notice of allowance for the '890 patent, the examiner stated that the only "distinct features" in the allowable subject matter were "specifying a maximum number of bytes available to be allocated to [an interleaver / deinterleaver] in a transmitted or received message, determining the amount of memory required by the [interleaver / deinterleaver], and then allocating the bytes of a shared memory to the [interleaver / deinterleaver] wherein the bytes allocated do not exceed the maximum number of available bytes specific in the message." (D.I. 312-8, Exh. H at A180). This statement counts for very little, because the patentee need not correct statements made in conjunction with an allowance. *See Salazar v. Procter & Gamble Co.*, 414 F.3d 1342, 1347 (Fed. Cir. 2005) ("unilateral statements by an examiner do not give rise to a clear disavowal of claim scope by an applicant").

Defendants emphasize that the examiner's statement followed the applicant's own amendment. (D.I. 312-8, Exh. H at A168-71; D.I. 353 at 20-21, 86-87). In a final rejection, the examiner cancelled all 45 original claims. (D.I. 312-8, Exh. H at A147-63). The cancelled claims included "[a] system for sharing resources in a transceiver . . . further comprising means for receiving from another transceiver information that is used to determine a maximum amount of shared memory that can be allocated." (*Id.* at A142). Following an interview, the applicant added eight new claims, two of which were independent claims. (*Id.* at A647-50). These independent claims covered "[a] method of allocating shared memory in a transceiver

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comprising . . . transmitting or receiving, by the transceiver, a message during initialization indicating a maximum number of bytes of memory that can be allocated to an [interleaver / deinterleaver]" and allocating a number of bytes to a deinterleaver and a number of bytes to an interleaver, "wherein the shared memory is used to simultaneously interleave" the two pluralities of allocated bytes. (*Id.* at A169-70). The examiner then allowed the claims, explaining that "[t]he closest prior art . . . discloses sharing a memory between the interleavers and deinterleavers . . . [but] fails to suggest limiting the memory allocated to the interleaver to a maximum number of bytes available that was specified in a transmitted or received message." (*Id.* at A180).

To find a prosecution history disclaimer requires a "clear and unmistakable disavowal of claim scope during prosecution." *Purdue Pharma. L.P. v. Endo Pharm. Inc.*, 438 F.3d 1123, 1136 (Fed. Cir. 2006). The patentee's amendment does not constitute a "clear and unmistakable disavowal of scope." The examiner cancelled 45 claims, and the patentee added eight new claims, which included numerous limitations but little explanation. (D.I. 312-8, Exh. H at A148-71). The Examiner Interview Summary Record does not provide any details about the interview that occurred between final rejection and the patentee's amendment. (D.I. 312-8, Exh. H at A165). The patentee's remarks accompanying the amendment state only that the new claims "more particularly claim[] certain aspects of the invention" and that "it was agreed [in the interview] that the proposed amendments to the claims 'were a step in the right direction.'"[3] The examiner's Notice of Allowance might specify a point of novelty, but nothing leading up to that unilateral statement gives a "clear and unmistakable" indication that the patentee meant to disavow all "messages" other than those specifying amounts of memory.

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[3] Applicant Arguments/Remarks Made in an Amendment, U.S. Patent App. No. 11/246,163, at 1 (Dec. 17, 2009).

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Even if the patentee's amendment does constitute a "clear and unmistakable disavowal of scope," a disclaimer that limits the scope of the claims in the '890 parent patent does not necessarily limit the scope of other claims in Family 3. The term at issue appears not in the '890 patent, but in its successors, including the '126 patent.

A parent patent's prosecution history may be relevant if "it addresses a limitation in common with the patent in suit." *Advanced Cardiovascular Sys., Inc. v. Medtronic, Inc.*, 265 F.3d 1294, 1305 (Fed. Cir. 2001). But when a purported disclaimer is "directed to specific claim terms that have been omitted or materially altered in subsequent applications (rather than to the invention itself), those disclaimers do not apply." *Saunders Grp., Inc. v. Comfortrac, Inc.*, 492 F.3d 1326, 1333 (Fed. Cir. 2007). "In general, a prosecution disclaimer will only apply to a subsequent patent if that patent contains the same claim limitation as its predecessor." *Regents of Univ. of Minn. v. AGA Med. Corp.*, 717 F.3d 929, 943 (Fed. Cir. 2013).

In *Sanofi v. Watson Laboratories Inc.*, all the patentee did to disclaim claim scope in the parent application was write an express limitation in the claims. 875 F.3d 636, 650 (Fed. Cir. 2017). That limitation did not appear in the patent in suit. *Id.* The Federal Circuit characterized the process as "fit[ting] a familiar pattern" where "an applicant adopts an explicit claim-narrowing limitation to achieve immediate issuance of a patent containing the narrowed claims and postpones to the prosecution of a continuation application further arguments about claims that lack the narrowing limitation." *Id.* "Without more," the disclaimer process did not limit claims that "lack the first patent's express narrowing limitation." *Id.* Similarly, the patentee here adopted an explicit claim-narrowing limitation in the '890 patent: a "message during initialization indicating a maximum number of bytes of memory." This limitation is not present in claim 1 of the '126 patent, which refers to a "message" only in the following context:

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wherein the memory is allocated between the first interleaving function and the second interleaving function in accordance with a message received during an initialization of the transceiver and wherein at least a portion of the memory may be allocated to the first interleaving function or the second interleaving function at any one particular time depending on the message.

('126 patent, claim 1). Nothing more exists to suggest that the '890 patent disclaimer should carry over to claim 1 of the '126 patent. Thus, the prosecution history does not support a construction specifying that the message include amounts of memory.

Because I do not adopt any of Plaintiff's "memory cells" language, Defendants' "bytes" language, and Defendants' "depending on the amounts of memory specified in the message" language, I adopt a plain meaning construction.

7. "portion of the memory"

a. *Plaintiff's proposed construction*: This term should not be construed out of context. See above for proposed construction in context.

b. *Defendants' proposed construction*: "number of bytes within the memory"

c. *Court's construction*: plain meaning

The parties agree that the issues for "portion of the memory" are the same as the issues for "amount of memory." (Tr. at 107:22-108:2, 109:13-16). Thus, because I give "amount of memory" a plain meaning construction, I give "portion of the memory" a plain meaning construction, as well.

8. "memory is allocated between the [first] interleaving function and the [second interleaving / deinterleaving] function"

a. *Plaintiff's proposed construction*: "an amount of the memory is allocated to the [first] interleaving function and an amount of memory is allocated to the [second interleaving / deinterleaving] function"

b. *Defendants' proposed construction*: "a number of bytes of memory are allocated to the [first] interleaving function and a number of bytes of memory allocated to the [second interleaving / deinterleaving] function"

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    c. *Court's construction*: "an amount of the memory is allocated to the [first] interleaving function and an amount of memory is allocated to the [second interleaving / deinterleaving] function"

The parties agree that the issues for this term are the same as the issues for "amount of memory." (Tr. at 107:2-108:5, 109:13-16). Thus, because I give the term "amount of memory" a plain meaning construction, as opposed to Defendants' proposed "number of bytes of memory" construction, I adopt Plaintiff's proposed construction.

9. **"wherein the generated message indicates how the memory has been allocated between the [first deinterleaving / interleaving] function and the [second] deinterleaving function"**

    a. *Plaintiff's proposed construction*: "wherein the generated message indicates the amount of memory that has been allocated to the [first deinterleaving / interleaving] function and the amount of memory allocated to the [second] deinterleaving function"

    b. *Defendants' proposed construction*: "wherein the generated message indicates a number of bytes of memory allocated to the [first deinterleaving / interleaving] function and a number of bytes of memory allocated to the [second] deinterleaving function"

    c. *Court's construction*: "wherein the generated message indicates the amount of memory that has been allocated to the [first deinterleaving / interleaving] function and the amount of memory allocated to the [second] deinterleaving function"

The issues for this term are the same as the issues for "amount of memory." (Tr. at 109:13-16). Defendants also re-raise their prosecution history argument. (D.I. 353 at 84-85). Thus, because I give the term "amount of memory" a plain meaning construction, as opposed to Defendants' proposed "number of bytes of memory" construction, I again adopt Plaintiff's proposed construction.

10. Claims alleged as indefinite under *IPXL Holdings*

Defendants argue that claim 13 of the '882 patent, claims 19 and 28 of the '473 patent, and claims 1 and 10 of the '126 patent are indefinite under *IPXL Holdings, L.L.C. v. Amazon.com, Inc.*, 430 F.3d 1377 (Fed. Cir. 2005). (D.I. 353 at 90).

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Claims 1 and 10 of the '126 patent are listed above. Claim 13 of the '882 patent reads as

follows:

13. A system that allocates shared memory comprising:

a transceiver that performs:

transmitting or receiving a message during initialization specifying a maximum number of bytes of memory that are available to be allocated to a deinterleaver;

determining an amount of memory required by the deinterleaver to deinterleave a first plurality of Reed Solomon (RS) coded data bytes within a shared memory;

allocating a first number of bytes of that shared memory to the deinterleaver to deinterleave a first plurality of Reed Solomon (RS) coded data bytes for transmission at a first data rate, wherein the allocated memory for the deinterleaver does not exceed the maximum number of bytes specified in the message;

allocating a second number of bytes of the shared memory to an interleaver to interleave a second plurality of RS coded data bytes received at a second data rate; and

deinterleaving the first plurality of RS coded data bytes within the shared memory allocated to the deinterleaver and interleaving the second plurality of RS coded data bytes within the shared memory allocated to the interleaver, wherein the shared memory allocated to the deinterleaver is used at the same time as the shared memory allocated to the interleaver.

('882 patent, claim 13). Additionally, claims 19 and 28 of the '473 patent reads as follows:

19. An apparatus comprising:

a multicarrier communications transceiver that is configured to perform an interleaving function associated with the first latency path and perform a deinterleaving function associated with a second latency path, the multicarrier communications transceiver being associated with a memory,

wherein the memory is allocated between the interleaving function and the deinterleaving function in accordance with a message received during an initialization of the transceiver and wherein at least a portion of the memory may be allocated to the interleaving function or the deinterleaving function at any one particular time depending on the message.

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28. An apparatus comprising:

a multicarrier communications transceiver that is configured to generate a message during an initialization of the transceiver, perform an interleaving function associated with a first latency path, and perform a deinterleaving function associated with a second latency path, the transceiver being associated with a memory,

wherein at least a portion of the memory may be allocated to the interleaving function or to the deinterleaving function at any one particular time and wherein the generated message indicates how the memory has been allocated between the interleaving function and the deinterleaving function.

('473 patent, claims 19, 28).

A single claim that "recites both a system and the method for using that system" is indefinite under § 112, ¶ 2. *IPXL Holdings, L.L.C.*, 430 F.3d at 1384. The *IPXL Holdings* rule exists because such a claim makes it impossible for a person of ordinary skill in the art to tell if the system or apparatus itself would infringe or if the system or apparatus would have to be used in a certain way to infringe. *Id.* at 1383-84 (citing *Amgen, Inc. v. Chugai Pharm. Co.*, 927 F.2d 1200, 1217 (Fed. Cir. 1991)).

However, "apparatus claims are not necessarily indefinite for using functional language." *Microprocessor Enhancement Corp v. Tex. Instruments, Inc.*, 520 F.3d 1367, 1375 (Fed. Cir. 2008). Rather, two types of system and apparatus claims are indefinite under *IPXL Holdings*. First, system and apparatus claims are indefinite if they also "claim activities performed by the user." *Mastermine Software, Inc. v. Microsoft Corp.*, 874 F.3d 1307, 1316 (Fed. Cir. 2017). Even if a claim "make[s] reference to user" action, it is indefinite only if it "explicitly claim[s] the user's act," and not if it claims only "the system's capability to receive and respond to user" action. *Id.* Second, system and apparatus claims are indefinite if they use "functional language" that is not "specifically tied to structure," but instead "appear[s] in isolation." *Id.*

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The parties agree that the claims at issue do not "claim activities performed by the user." (Tr. at 117:1-8). They dispute only whether the claims' "functional language" appears "in isolation" or "is specifically tied to structure." *Id.*

In *Rembrandt Data Techs. LP v. AOL, LLC*, the Federal Circuit held the following claim to be indefinite:

> 3. A data transmitting device for transmitting signals corresponding to an incoming stream of bits, comprising:
>
> first buffer means for partitioning said stream into frames of unequal number of bits and for separating the bits of each frame into a first group and a second group of bits;
>
> fractional encoding means for receiving the first group of bits of each frame and performing fractional encoding to generate a group of fractionally encoded bits;
>
> second buffer means for combining said second group of bits with said group of fractionally encoded bits to form frames of equal number of bits; trellis encoding means for trellis encoding the frames from said second buffer means; and
>
> *transmitting the trellis encoded frames.*

641 F.3d 1331, 1339 (Fed. Cir. 2011) (emphasis added). The court explained that "[t]he first four elements of claim 3 of the '236 patent recite apparatus elements: buffer means, fractional encoding means, second buffer means, and trellis encoding means," whereas "[t]he final element is a method: 'transmitting the trellis encoded frames.'" *Id.*

In *Mastermine Software*, on the other hand, the court held the following claim which disclosed, in part, "[a] system comprising":

> ....
>
> a reporting module installed within the CRM software application ...;
>
> ....
>
> wherein the reporting module installed within the CRM software application *presents a* set of user-selectable database fields as a function of the selected report

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template, *receives from the user a selection* of one or more of the user-selectable database fields, and *generates* a database query as a function of the user selected database fields;

....

874 F.3d at 1315 (emphasis added). The court distinguished the claim from the *Rembrandt* claim given that "the functional language here does not appear in isolation, but rather, is specifically tied to structure: the reporting module installed within the CRM software application." *Id.* at 1315-16.

Defendants argue that "wherein the memory is allocated between the [interleaving / first interleaving] function and the [deinterleaving / second interleaving] function in accordance with a message received during an initialization of the transceiver," a limitation that appears in claim 19 of the '473 patent and claim 1 of the '126 patent, is "essentially just giving a step" akin to the final limitation in *Rembrandt*, thereby rendering the claims invalid. Defendants contend these claims are not "specifically tied to structure," because they are "not really telling you where the message is coming from or what is doing the allocating." (Tr. at 120:11-14). Furthermore, Defendants contend that the claim language requires a step to be performed after a message is received, an "element of sequence" which indicates a method is claimed in conjunction with the claimed transceiver. (Tr. at 115:6-11).

Plaintiff avers that the claims at issue use "functional" language that is specifically "tied to structure." (Tr. at 125-26). Plaintiff argues that the limitation focuses on the functional capability of a transceiver and how that transceiver allocates memory. (*Id.*).

Claim 19 of the '473 patent and claim 1 of the '126 patent indicate that memory is allocated by the transceiver only after a message is received. But the *Mastermine Software* claims similarly contemplated that the claimed "reporting module" could "generate[] a database

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query" only upon its reception of a user "selection." 874 F.3d at 1315. Nonetheless, the claim

was found not indefinite because this "functional language" was tied directly to the "reporting

module." *Id.* at 1316. Similarly, the claims at issue use "functional language" that describes the

transceiver structure's memory allocating capabilities. Unlike the *Rembrandt* claim, for which it

was unclear whether infringement was triggered by the creation of an infringing "device" itself

or by some infringing use of that "device," here, a person of ordinary skill in the art would

understand that infringement is triggered by the use of an infringing "transceiver." 641 F.3d at

1339. Thus, claim 19 of the '473 patent and claim 1 of the '126 patent are not indefinite.

The parties agree that claim 28 of the '473 patent and claim 10 of the '126 patent rise and

fall with claim 19 of the '473 patent and claim 1 of the '126 patent, respectively. (Tr. at 120:19-

22). Thus, those claims are also not indefinite.

Claim 13 of the '883 patent is also distinguishable from *Rembrandt*. Claim 13 covers

"shared memory comprising . . . a transceiver that performs" several steps. The *Rembrandt*

claim, on the other hand, claims a "device" and then adds a final "transmitting" step. 641 F.3d at

1339. Claim 13 defines its steps as "transceiver" functions, whereas the *Rembrandt*

"transmitting" step is "isolated." *See Mastermine Software,* 874 F.3d at 1316. Thus, Claim 13 is

not indefinite.

IV.   CONCLUSION

Within five days the parties shall submit a proposed order consistent with this

Memorandum Opinion.

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